IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Anton BERNS; Els ROBANUS Application of:

Confirmation No.:

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Serial No.:

MAANDAG; Hein TE RIELE To Be Assigned [Continuation of

Art Unit:

To Be Assigned

Application No. 09/253,818]

Filed:

November 24, 2003

Examiner:

To Be Assigned

For:

GENE TARGETING IN ANIMAL CELLS

Attorney Docket No.: 8535-068-999

USING ISOGENIC DNA CONSTRUCTS

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, it is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

This application is a continuation application under 37 C.F.R. §1.60 or §1.53(b) or (d).

Enclosures accompanying this Information Disclosure Statement is a list of all patents, publications, applications, or other information submitted for consideration by the office.

Copies of publications listed on Form PTO-1449 from prior application Serial No.09/253,818, filed on February 19, 1999, of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b) before the mailing of the first Office action on the merits.

The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Pennie & Edmonds LLP Deposit Account No. 16-1150.

No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date:

November 24, 2003

By:

T. Christopher Tsang

(Reg. No.)

PENNIE & EDMONDS LLP 1155 Avenue of the Americas

New York, New York 10036-2711

(212) 790-9090

Enclosures

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					ATTY DOCKET NO.		APPLICATIO	N NO.
					8535-068-999		To Be As	signed
LIST OF R	EFEI	RENCES CITED BY	APPLICA	NT	APPLICANT			
		(Use several sheets if r	necessary)			Berns	et al.	
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*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	и	AME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	A01	5,789,215	8/4/98	Berns et al.				
	A02	5,631,153	5/20/97	Capecchi et al.				,
	A03	5,627,059	5/6/97	Capecchi et al.				
	A04	5,612,205	3/18/97	Kay et al.				
	A05	5,487,992	1/30/96	Capecchi et al.				
	A06	5,464,764	11/7/95	Capecchi et al.				
	A07	5,346,818	9/13/94	Schafer et al.				
	A08	5,175,384	12/29/92	Krimpenfort et al.	<u>.</u>			
	A09	4,997,757	3/5/91	Schiestl		L		

Bertling

Roizman

4,950,599

4,859,587

A10

A11

8/21/90

8/22/89

FOREIGN PATENT DOCUMENTS DOCUMENT NUMBER DATE CLASS SUBCLASS TRANSLATION COUNTRY YES NO EP 241 044 10/14/87 Europe B01 EP 265 556 5/4/88 Europe B02 EP 308 220 3/22/89 Europe B03 EP 315 062 5/10/89 Europe B04 EP 317 509 5/24/89 Europe Abstract only B05 EP 357 127 3/7/90 Europe **B**06 EP 374 913 6/27/90 Europe B07 EP 386 766 9/12/90 Europe Abstract only B08 EP 397 560 11/14/90 Europe B09 EP 408 301 1/16/91 Europe B10 EP 410 748 1/30/91 B11 Europe EP 414 297 2/27/91 Europe B12 WO 83/01176 4/14/83 PCT B13 WO 87/02702 PCT 5/7/87 B14 WO 88/06182 8/25/88 PCT Abstract only B15 WO 90/07576 7/12/90 PCT **B16** WO 89/12684 12/28/89 PCT B17 WO 90/00616 1/25/90 PCT B18 WO 90/07576 7/12/90 PCT Abstract only B19 WO 90/09443 8/23/90 PCT B20 WO 90/11354 4/10/90 PCT Abstract only B21

B22	WO 90/12880	11/1/90	PCT	
B23	WO 91/01087	2/7/91	PCT	
B24	WO 91/01140	2/7/91	PCT	
B25	WO 91/02070	2/21/91	PCT	
B26	WO 91/02797	3/7/91	PCT	Abstract only
B27	WO 91/06667	5/16/91	PCT	
B28	WO 93/04169	3/4/1993	PCT	
 B29	DD 284898	11/28/90	Germany	Abstract only
 B30	JP 63068074	3/26/88	Japan	Abstract only
B31	JP 63267279	11/4/88	Japan	Abstract only
B32	JP 3035784	2/15/91	Japan	Abstract only
B33	FR 2615527	11/25/88	France	Abstract only
B34	AU 51199/90	3/8/90	Australia	

	OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)
C01	Adair et al., "Targeted homologous recombinations at the endogenous adenine phosphoribosyltransferase locus in chinese hamster cells," PNAS, 86:4574-4578 (1989).
C02	Bain et al., "E2A Proteins Are Required for Proper B Cell Development and Initiation of Immunoglobulin Gene Rearrangements," Cell, 79:885-892 (1994).
C03	Baker et al., "Homologous Recombination between Transferred and Chromosomal Immunoglobulin κ Genes," Molecular and Cellular Biology, 8(10):4041-4047 (1988).
C04	Bollag et al., "Homologous recombination in mammalian cells," Annual Review of Genetics, 23:199-225 (1989).
C05	Camerini-Otera et al., "Right on Target," The New Biologist, 2(4):337-341 (1990).
C06	Cepecchi, M.R., "The New Mouse Genetics: Altering the Genome by Gene Targeting," <u>Trends in Genetics</u> , 5(3):70-76 (1989).
C07	Capecchi, M.R., "Altering the Genome by Homologous Recombination," Science, 244:1288-1292 (1989).
C08	Charron et al., "High-Frequency Disruption of the N-myc Gene in Embryonic Stem and Pre-B Cell Lines by Homologous Recombination," Molecular Cell Biology, 10(4):1799-1804 (1990).
C09	Chen et al., "B cell development in mice that lack one or both immunoglobulin χ light chain genes," EMBO Journal, 12(3):821-830 (1993).
C10	Chisaka et al., Developmental defects of the ear, cranial nerves and hindbrain resulting from targeted disruption of the mouse homeobox gene <i>HOX-1.6</i> ," Nature, 355:516-520 (1992).
C11	Cruz et al., "Gene replacement in parasitic protozoa," Nature, 348:171-173 (1990).
C12	Deng et al., "Reexamination of Gene Targeting Frequency as a Function of the Extent of Homology between the Targeting Vector and the Target Locus," Molecular and Cellular Biology, 12(8):3365-3371 (1992).
C13	Deng et al., "Location of Crossovers during Gene Targeting with Insertion and Replacement Vectors," Molecular and Cellular Biology, 13(4):2134-2140 (1993).
C14	Doetschman et al., "Targetted correction of a mutant HPRT gene in mouse embryonic stem cells," Nature, 330:576-578 (1987).
C15	Doetschman et al., "Targeted mutation of the <i>Hprt</i> gene in mouse embryonic stem cells," <u>PNAS</u> , 85:8583 (1988).
C16	Fell et al., "Homologous recombination in hybridoma cells: Heavy chain chimeric antibody produced by gene targeting," PNAS, 86:8507-8511 (1989).
C17	Fenton et al., "Isotypic Exclusion of γδ T Cell Receptors in Transgenic Mice Bearing a Rearranged β-Chain Gene," Science, 241:1089-1092 (1988).
C18	Fink et al., "Gene conversion in the absence of reciprocal recombation," Nature, 310:728-729 (1984).
C19	Gridley, T., "Insertional Versus Targeted Mutagenesis in Mice," The New Biologist, 3(11):1025-1034 (1991).
C20	Hasty et al., "Target Frequency and Integration Pattern for Insertion and Replacement Vectors in Embryonic Stem Cells," Molecular and Cellular Biology, 11(9):4509-4517 (1991).
C21	Hasty et al., "The Length of Homology Required for Gene Targeting in Embryonic Stem Cells," Molecular and Cellular Biology, 11(11):5586-5591 (1991).
C22	Hasty et al., "The Role and Fate of DNA Ends for Homologous Recombination in Embryonic Stem Cells," Molecular and Cellular Biology, 12(6):2464-2474 (1992).
C23	Hooper et al., "HPRT-deficient (Leshc-Nyhan) mouse embryos derived from germline colonization by cultured cells," Nature, 326:292-295 (1987).
C24	Itzhaki et al., "Targeted disruption of a human interferon-inducible gene detected by secretion of human growth hormone," Nucleic Acids Research, 19(14):3835-3842 (1991).

	C25	Itzhaki et al., "Targeted breakage of a human chromosome mediated by cloned human telomeric DNA," <u>Nature</u> Genetics, 2:283-287 (1992).
	C26	Jasin et al., "Gene targeting at the human CD4 locus by epitope addition," Genes & Development, 4:157-166 (1990).
	C27	Jasin et al., "Homologous integration in mammalian cells without target gene selection," Genes & Development, 2:1353-1363 (1988).
	C28	Joyner et al., "Production of a mutation in mouse <i>En-2</i> gene by homologous recombination in embryonic stem cells," Nature, 338:153-156 (1989).
	C29	Kim et al., "Inactivation of the human β -globin gene by targeted insertion into the β -globin locus control region," Genes & Development, 6:928-938 (1992).
	C30	Klein, H.L., "Lack of association between intrachromosomal gene conversion and reciprocal exchange," Nature, 310:748-753 (1984).
_	C31	Koller et al., "Germ-line transmission of a planned alteration made in a hypoxanthine phosphoribosyltransferase gene by homologous recombination in embryonic stem cells," PNAS, 86:8927-8931 (1989).
	C32	Koller et al., "Toward an animal model of cystic fibrosis: Targeted interruption of exon 10 of the cystic fibrosis transmembrane regulator gene in embryonic stem cells," PNAS, 88:107030-10734 (1991).
	C33	Koller et al., "Inactivating the β 2-microglobulin locus in mouse embryonic stem cells by homologous recombination," PNAS, 86:8932-8935 (1989).
	C34	Letsou et al., "Effect of the Molecular Nature of Mutation on the Efficiency of Intrachromosomal Gene Conversion in Mouse Cells," Genetics, 117:759-769 (1987).
	C35	Lin et al., "recombination in mouse L cells between DNA introduced into cells and homologous chromosomal sequences," PNAS, 82:1391-1395 (1985).
	C36	Lindblad-Toh, K. et al., <i>Nature Genetics</i> , 24:381-386 (2000).
	C37	Lowy et al., "Isolation of Transforming DNA: Cloning the Hamster aprt Gene," Cell, 22:817-823 (1980).
	C38	Lyon, M.F. et al. (eds.), Genetic Variants and Strains of the Laboratory Mouse, Vol. Two, Third Edition, Chapter 14 (pp. 1532-1536) entitled "Rules for Nomenclature of Inbred Strains."
	C39	Lyon, M.F. et al. (eds.), Genetic Variants and Strains of the Laboratory Mouse, Vol. Two, Third Edition, Chapter 16 (pp. 1577-1596) entitled "The Laboratory Mouse and Its Wild Relatives."
	C40	Mansour et al., "Disruption of the proto-oncogene <i>int-2</i> in mouse embryo-derived stem cells: a general strategy for targeting mutations to non-selectabel genes," Nature, 336:348-352 (1988).
	C41	Miller et al., "Targeted integration of the <i>Ren-1D</i> locus in mouse embryonic stem cells," <u>PNAS</u> , 89:5020-5024 (1992).
	C42	Nabel et al., "Perspectives on Human Gene Therapy," chapter 26, pages 315-319 from Annual Reports in Medicinal Chemistry, Vol. 26, 1991, Academic Press.
	C43	Nussenzweig et al., "Allelic Exclusion in Transgenic Mice That Express the Membrane Form of Immunoglobulin μ ," Science, 236:816-819 (1987).
	C44	Pascoe et al., "Genes and functions: trapping and targeting in embryonic stem cells," <u>Biochimica et Biophysica Acta</u> , 1114:209-221 (1992).
	C45	Reeck et al., "Homology in Proteins and Nucleic Acids: a Terminology Muddle and a Way out of it," <u>Cell</u> , 50:667 (1987).
	C46	Rubnitz et al., "The Minimum Amount of Homology Required for Homologous Recombination in Mammalian Cells," Molecular and Cellular Biology, 4(11):2253-2258 (1984).
	C47	Schinkel et al., "Disruption of the Mouse <i>mdr1a</i> P-Glycoprotein Gene Leads to a Deficiency in the Blood-Brain Barrier and to Increased Sensitivity to Drugs," Cell. 77:491-502 (1994).
	C48	Schwartzberg et al., "Germ-Line transmission of a <i>c-abl</i> Mutation Produced by Targeted Gene disruption in ES Cells," Science, 246:799-803 (1989).
	C49	Sedivy et al., "Positive genetic selection for gene disruption in mammalian cells by homologous recombination," PNAS, 86:227-231 (1991).
	C50	Singer et al., "Determination of the Amount of Homology Required for Recombination in Bacteriophage T4," Cell, 31:25-33 (1982).
	C51	Shen et al., "Homologous Recombination in <i>Escherichia Coli</i> : Dependence on Substrate Length and Homology," Genetics, 112:441-457 (1986).
	C52	Shinkai et al., "Restoration of T Cell Development in RAG-2-Deficient Mice by Functional TCR Transgenes," Science, 259:822-825 (1993).
	C53	Simpson, E.M. et al., Nature Genetics, 16:19-27 (1997).
	C54	Smithies et al., "Insertion of DNA sequences into the human chromosomal β-globin locus by homologous recombination," Nature, 317:230-324 (1985).
	C55	Song et al., "Accurate Modification of a chromosomal plasmid by homologous recombination in human cells," PNAS, 84:6820-6824 (1987).
	C56	Soriano et al., "Targeted Disruption of the c-src Proto-Oncogene Leads to Osteopetrosis in Mice," Cell, 64:693-702 (1991).
	C57	te Riele et al., "Consecutive inactivation of both alleles of the <i>pim-1</i> proto-oncogene by homologous recombination in embryonic stem cells," Nature, 348:649-651 (1990).
	C58	ten Asbroek et al., "Targeted insertion of the neomycin phosphotransferase gene into the tubulin gene cluster of
	C59	Trypanosoma brucei," Nature, 348:174-175 (1990). Thomas et al., "High Frequency Targeting of Genes to Specific Sites in the Mammalian Genome," Cell, 44:419-428
L	100	NY2: 1477764.1

	(1986).
C60	Thomas et al., "Site-Directed Mutagenesis by Gene targeting in Mouse Embryo-Derived Stem Cells," Cell, 51:503-512 (1987).
C61	Threadgill, D.W. et al., Mammalian Genome, 8:390-393 (1997).
C62	Uematsu et al., "In Transgenic Mice the Introduced Functional T Cell Receptor β Gene Prevents Expression of Endogenous β Genes," Cell, 52:831-841 (1988).
C63	van der Lugt et al., "Posterior transformation, neurological abnormalities, and service hematopoietic defects in mice with a targeted deletion of the <i>bmi-1</i> proto-oncogene," Genes & Development, 8:757-769 (1994).
C64	van der Lugt et al., "A pgk::hprt fusion as a selectable marker for targeting of genes in mouse embryonic stem cells: disruption of the T-cell receptor δ-chain-encoding gene," Gene, 105:263-267 (1991).
C65	van Deursen et al., "Targeting of the creatine kinase M gene in embryonic stem cells using isogenic and nonisogenic vectors," Nucleic Acids Research, 20(15):3815-3820 (1992).
C66	Waldman et al., "Dependence of Intrachromosomal Recombination in Mammalian Cells on Uninterrupted Homology," Molecular and Cellular Biology, 8(12):5350-5357 (1988).
C67	Waldman et al., "Differential effects of base-pair mismatch on intrachromosomal versus extrachromosomal recombination in mouse cells," PNAS, 84:5340-5344 (1987).
C68	Watt et al., "Homology requirements for recombination in Escherichia coli," PNAS, 82:4768-4772 (1985).
C69	Yenofsky et al., "A mutant neomycin phosphotransferase II gene reduces the resistance of transformants to antibiotic selection pressure," PNAS, 87:3435-3439 (1990).
C70	Zheng et al, "Gene targeting in normal and amplified cell lines," Nature, 344:170-173 (1990).
C71	Zijlstra et al., "Germ-line transmission of a disrupted β_2 -microglobulin gene produced by homologous recombination in embryonic stem cells," Nature, 342:435-438 (1989).
C72	Zimmer et al., "Production of chimaeric mice containing embryonic stem (ES) cells carrying a homoeobox <i>Hox 1.1</i> allele mutated by homologous recombination," Nature, 338:150-153 (1989).

EXAMINER	DATE CONSIDERED

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.